

H2

PATENT
Attorney Docket No. 28845

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:
WARKHEDE ET AL.

Application No. 10/042,847

Filed: January 8, 2002

For: Method And Apparatus For Mapping
Prefixes and Values of a Hierarchical
Space to Other Representations

Group Art Unit: 2122

Examiner: TBD

Assistant Commissioner for Patents
Washington, D.C. 20231

Received

MAR 01 2002

Technology Center 2100

INFORMATION DISCLOSURE STATEMENT

Pursuant to 37 C.F.R. §§ 1.97 and 1.98, the references listed on the enclosed Form PTO-1449 are submitted for consideration by the Examiner in the examination of the above-identified patent application. The full consideration of the references in their entirety by the Examiner is respectfully requested and encouraged. Also, it is respectfully requested that the references be entered into the record of the present application and that the Examiner place his or her initials in the appropriate area on the enclosed Form PTO-1449, thereby indicating the Examiner's consideration of each of the references.

A bona fide attempt is made to comply with §§ 1.97-98. The filing of this information disclosure statement should not be construed as a representation that a search has been made, nor is it to be construed to be an admission that the information cited in the statement is, or is considered to be, material to patentability as defined in § 1.56(b). Additionally, the submission of this IDS is for the purpose of providing a complete record and is not a concession that the references are prior art to the invention claimed in the patent application. The right is expressly reserved to establish an invention date earlier than the above-identified filing date in order to remove any reference submitted herewith as prior art should it be deemed appropriate to do so. Furthermore, the submission of the references is not to be taken as a concession that any reference represents art that is relevant or analogous to the claimed invention. Accordingly, the right to argue that any reference is not properly within the scope of prior art relevant to an examination of the claims in the above-identified application is also expressly reserved.

The Information Disclosure Statement is being filed:

Under § 1.97(b): (1) within three months of the filing date of a national application other than a continued prosecution application under § 1.53(d); (2) within three months of the date of entry of the national stage as set forth in § 1.491 in an international application; (3) before the mailing of a first Office action on the merits; or (4) before the mailing of a first Office action after the filing of a request for continued examination under § 1.114.

Under § 1.97(c): after (1), (2), or (3) above (i.e., after paragraph (b)) and before the mailing date of any of a final action under § 1.113, a notice of allowance under § 1.311, or an action that otherwise closes prosecution in the application, and is accompanied by:

the statement specified in 37 C.F.R. § 1.97(e):

Each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement; or

That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in § 1.56(c) more than three months prior to the filing of the information disclosure statement.

the fee set forth in 37 C.F.R. § 1.17(p) (see "Fees" below).

Under § 1.97(d): after the period specified in § 1.97(c) and before payment of the issue fee, and is accompanied by:

the statement specified in 37 C.F.R. § 1.97(e):

Each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement; or

That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in § 1.56(c) more than three months prior to the filing of the information disclosure statement.

the fee set forth in 37 C.F.R. § 1.17(p) (see "Fees" below).

In re WARKHEDE ET AL.
Serial No. 10/042,847

Copies Of The References

Enclosed herewith are copies of the references listed on the enclosed Form PTO-1449. A concise explanation of the relevance, as it is presently understood by the individual designated in § 1.56(c) most knowledgeable about the content of the information, of each patent, publication, or other information listed that is not in the English language is included either separate from applicant's specification or incorporated therein. Furthermore, a copy of the translation of a non-English language reference is included herewith if a written English-language translation of a non-English-language document, or portion thereof, is within the possession, custody, or control of, or is readily available to any individual designated in § 1.56(c).

A copy of a foreign search report is enclosed herewith.

Per 37 C.F.R. § 1.98(d), copies of the references listed on the enclosed Form PTO-1449 are not provided as they were previously submitted to, or cited by, the Office in an earlier application, and (1) the earlier application is properly identified in the information disclosure statement and is relied on for an earlier effective filing date under 35 U.S.C. 120; and (2) the information disclosure statement submitted in the earlier application complies with paragraphs (a) through (c) of this 37 C.F.R. § 198. The details of the parent application(s) relied upon for an earlier filing date under 35 U.S.C. § 120 in which copies of the references were previously furnished are set out below:

| U.S. APPLICATIONS | | Status (<i>check one</i>) | | |
|-------------------|------------------|-----------------------------|---------|-----------|
| U.S. APPLICATIONS | U.S. FILING DATE | PATENTED | PENDING | ABANDONED |
| 1. | | | | |
| 2. | | | | |
| 3. | | | | |

In re WARKHEDE ET AL.
Serial No. 10/042,847

Fees

No fee is owed by the applicant(s).

The IDS Fee of \$180.00 is due.

Attached is check No. in the amount of \$180.

Charge Deposit Account No. 501430 in the amount of \$180.

Authorization To Charge Additional Fees and Credit any Overpayment

If any additional fees are owed in connection with this communication, please charge Deposit Account No. 501430.

Credit Account No. 501430 for any overpayment in connection with this communication.

Date: February 19, 2002 Respectfully submitted,

The Law Office of Kirk D. Williams

By



Kirk D. Williams, Esq., Reg. 42,229
Customer Number 26327
1234 S. OGDEN ST
DENVER, CO 80210-1713
303-282-0151
303-778-0748 (facsimile)

FORM PTO-1449
MODIFIED

U.S. DEPARTMENT OF COMMERCE
PATENT AND TRADEMARK OFFICE

**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**

Sheet

1

of

4

| | |
|----------------------|------------------|
| Application Number | 10/042,847 |
| Filing Date | January 8, 2002 |
| First Named Inventor | Priyank Warkhede |
| Group Art Unit | 2122 |
| Examiner Name | TBD |
| Attorney Docket No. | 28845 |

U.S. PATENT DOCUMENTS

| EXAMINER'S INITIALS | Cite No. | Document Number | ISSUE or PUBL. DATE (MM-DD-YYYY) | Name of Patentee or Applicant of Cited Document |
|---------------------|----------|-----------------|----------------------------------|---|
| | AA | US - 5528701 | 06-18-1996 | Aref |
| | AB | US - 5651099 | 07-22-1997 | Konsella |
| | AC | US - 5721889 | 02-24-1998 | Namba |
| | AD | US - 5781772 | 07-14-1998 | Wilkinson, III et al. |
| | AE | US - 5809501 | 09-15-1998 | Noven |
| | AF | US - 5829004 | 10-27-1998 | Au |
| | AG | US - 5848416 | 12-08-1998 | Tikkanen |
| | AH | US - 5884297 | 03-16-1999 | Noven |
| | AI | US - 6018524 | 01-25-2000 | Turner et al. |
| | AJ | US - 6067574 | 05-23-2000 | Tzeng |
| | AK | US - 6115716 | 09-05-2000 | Tikkanen et al. |
| | AL | US - 6237061 | 05-22-2001 | Srinivasan et al. |
| | AM | US - 6289414 | 09-11-2001 | Feldmeier et al. |
| | AN | US - 6298339 | 10-02-2001 | Bjornson |
| | | | | |

| | | | | | |
|--|---|--|---|----------------------|------------------|
| FORM PTO-1449 MODIFIED | | U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE | | Application Number | 10/042,847 |
| INFORMATION DISCLOSURE STATEMENT BY APPLICANT | | | | Filing Date | January 8, 2002 |
| | | | | First Named Inventor | Priyank Warkhede |
| | | | | Group Art Unit | 2122 |
| | | | | Examiner Name | TBD |
| Sheet | 2 | of | 4 | Attorney Docket No. | 28845 |

| EXAMINER'S INITIALS | Cite No. | OTHER DOCUMENTS |
|---------------------|----------|--|
| | BA | DONALD R. MORRISON, "PATRICIA - Practical Algorithm to Retrieve Information Coded in Alphanumeric," Journal of the ACM, Vol. 15, No. 4, October 1968, pp. 514-534. |
| | BB | WALDVOGEL ET AL., "Scalable High Speed IP Routing Lookups," Proc. SIGCOMM '97, ACM, 1997, pp. 25-36. |
| | BC | LAMPSON ET AL., "IP Lookups Using Multiway and Multicolumn Search," Proc. Infocom 98, March 1998, 24 pages. |
| | BD | V. SRINIVASAN and GEORGE VARGHESE, "Faster IP Lookups using Controlled Prefix Expansion," ACM SIGMETRICS Performance Evaluation Review, Vol. 26 No.1, June 1998, p.1-10. |
| | BE | STEFAN NILSSON and GUNNAR KARLSSON, "Fast Address Look-up for Internet Routers," Proceedings of IEEE Broadband Communications, April 1998, 12 pages. |
| | BF | WILLIAM N. EATHERTON, HARDWARE-BASED INTERNET PROTOCOL PREFIX LOOKUPS, Master's thesis, Sever Institute, Washington University, St. Louis, MO, May 1999, 109 pages. |
| | BG | LAMPSON ET AL., "IP Lookups Using Multiway and Multicolumn Search," IEEE Transactions on Networking, Vol. 7, No. 3, June 1999, pp. 324-334. |
| | BH | LOCKWOOD ET AL., "Field Programmable Port Extender (FPX) for Distributed Routing and Queuing," Proceedings of the ACM/SIGDA international symposium on Field programmable gate arrays, February 2000, pp. 137-144. |
| | BI | RUIZ-SANCHEZ ET AL., "Survey and Taxonomy of IP Address Lookup Algorithms," IEEE Network Magazine, Vol. 15, No. 2, March/April 2001, pp. 8-23. |
| | BJ | PANKAJ GUPTA and NICK MCKEWIN, "Algorithms for Packet Classification," IEEE Network Magazine, Vol. 15, No. 2, March/April 2001, pp. 24-32. |
| | BK | IYER ET AL., "ClassiPI: An Architecture for Fast and Flexible Packet Classification," IEEE Network Magazine, Vol. 15, No. 2, March/April 2001, pp. 33-41. |
| | BL | WALDVOGEL ET AL., "Scalable High Speed Prefix Matching," ACM Transactions on Computer Systems, Vol. 19, No. 4, November 2001, pp. 440-482. |
| | | |

FORM PTO-1449
MODIFIED

U.S. DEPARTMENT OF COMMERCE
PATENT AND TRADEMARK OFFICE

**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**

Sheet

3

of

4

Application Number

10/042,847

Filing Date

January 8, 2002

First Named Inventor

Priyank Warkhede

Group Art Unit

2122

Examiner Name

TBD

Attorney Docket No. 28845

U.S. PATENT DOCUMENTS

| EXAMINER'S INITIALS | Cite No. | Document Number | ISSUE or PUBL. DATE (MM-DD-YYYY) | Name of Patentee or Applicant of Cited Document |
|---------------------|----------|-----------------|----------------------------------|---|
| | CA | US - 5088032 | 02-11-1992 | Bosack |
| | CB | US - 5319763 | 06-07-1994 | Ho et al. |
| | CC | US - 5481540 | 01-02-1996 | Huang |
| | CD | US - 5515370 | 05-07-1996 | Rau |
| | CE | US - 5740171 | 04-14-1998 | Mazzola et al. |
| | CF | US - 5842040 | 11-24-1998 | Hughes et al. |
| | CG | US - 5898689 | 04-27-1999 | Kumar et al. |
| | CH | US - 5920886 | 07-06-1999 | Feldmeier |
| | CI | US - 5930359 | 07-27-1999 | Kempke et al. |
| | CJ | US - 5956336 | 09-21-1999 | Loschke et al. |
| | CK | US - 6000008 | 12-07-1999 | Simcoe |
| | CL | US - 6061368 | 05-09-2000 | Hitzelberger |
| | CM | US - 6091725 | 07-18-2000 | Cheriton et al. |
| | CN | US - 6097724 | 08-01-2000 | Kartalopoulos |
| | CO | US - 6141738 | 10-31-2000 | Munter et al. |
| | CP | US - 6148364 | 11-14-2000 | Srinivasan et al. |
| | CQ | US - 6181698 | 01-30-2001 | Hariguchi |
| | CR | US - 6236658 | 05-22-2001 | Essbaum et al. |
| | CS | US - 6237061 | 05-22-2001 | Srinivasan et al. |
| | CT | US - 6243667 | 06-05-2001 | Kerr et al. |
| | CU | US - 6295576 | 09-25-2001 | Ogura et al. |
| | CV | US - 6307855 | 10-23-2001 | Hariguchi |
| | | | | |

FORM PTO-1449
MODIFIED

U.S. DEPARTMENT OF COMMERCE
PATENT AND TRADEMARK OFFICE

**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**

| | |
|----------------------|------------------|
| Application Number | 10/042,847 |
| Filing Date | January 8, 2002 |
| First Named Inventor | Priyank Warkhede |
| Group Art Unit | 2122 |
| Examiner Name | TBD |

Sheet

4

of

4

Attorney Docket No.

28845

| EXAMINER'S INITIALS | Cite No. | OTHER DOCUMENTS |
|---------------------|----------|--|
| | DA | JON P. WADE and CHARLES G. SODINI, "A Ternary Content Addressable Search Engine," IEEE Journal of Solid-State Circuits, Vol. 24, No. 4, August 1989, pp. 1003-1013. |
| | DB | TEUVO KOHONEN, CONTENT-ADDRESSABLE MEMORIES, 1987, pp. 128-129 and 142-144, Springer-Verlang, New York. |
| | DC | BRIAN DIPERT, ed., "Special-purpose SRAMs Smooth the Ride," EDN, June 24, 1999, pp. 93-104. |
| | DD | "Extending the LANCAM Comparand," Application Brief AB-N3, Rev. 1.0a Draft, Music Semiconductors, Milpitas, CA, September 30, 1998, 4 pages. |
| | DE | "Advantages of CAM in ASIC-Based Network Address Processing," Application Brief AB-N11, Rev. 1.2a Draft, Music Semiconductors, Milpitas, CA, September 30, 1998, 4 pages. |
| | DF | "Virtual Memory Applications of the MU9C1480A LANCAM," Application Note AN-N3, Rev. 1a, Music Semiconductors, Milpitas, CA, September 30, 1998, 12 pages. |
| | DG | "Using the MU9C1965A LANCAM MP for Data Wider than 128 Bits," Application Note AN-N19, Rev. 1a, Music Semiconductors, Milpitas, CA, September 30, 1998, 16 pages. |
| | DH | "Fast IPv4 and IPv4 CIDR Address Translation and Filtering Using the MUAC Routing CoProcessor (RCP)," Application Note AN-N25, Rev. 0a, Music Semiconductors, Milpitas, CA, October 1, 1998, 16 pages. |
| | DI | "Using MUSIC Devices and RCPs for IP Flow Recognition," Application Note AN-N27, Rev. 0, Music Semiconductors, Milpitas, CA, October 21, 1998, 20 pages. |
| | DJ | "Wide Ternary Searches Using Music CAMs and RCPs," Application Note AN-N31, Rev. 0, Music Semiconductors, Milpitas, CA, April 13, 1999, 8 pages. |
| | | |